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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/982,497	10/18/2001	Radu Victor Balan	2001P20166 US	7505

7590 07/23/2004

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EXAMINER

SKED, MATTHEW J

ART UNIT PAPER NUMBER

2655

DATE MAILED: 07/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/982,497

Applicant(s)

BALAN ET AL.

Examiner

Matthew J Sked

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5 and 9-16 is/are allowed.
- 6) ☒ Claim(s) 6-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

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Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>05/08/02</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: on page 9, line 16 " α " should be changed to $-a-$ and on page 11 equations 14a and 14b the first " ω " on the right hand side of each equation should be changed to $-w-$.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 6-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 6 recites the limitation "said rescaling of said weighting matrix" in line 1. There is insufficient antecedent basis for this limitation in the claim. The previous claims do not teach the rescaling of the weighting matrix. For the purposes of prosecution the claim limitation will be interpreted to read $-said\ rescaling\ to\ create\ a\ weighting\ matrix-$.

5. Claims 7 and 8 are rejected because they do not correct this deficiency in claim
- 6.

Allowable Subject Matter

6. Claims 1-5 and 9-16 are allowed.

7. The following is an examiner's statement of reasons for allowance: Claims 1, 15 and 16 are found to be allowable over the prior art because they recite the combination of denoising (demixing) signal mixtures by constructing time-frequency representations (histograms) for signal of interest and non-signal of interest segments of signal mixtures, combining these histograms to create a weighting matrix, and rescaling the time-frequency representations thereby for synthesizing the denoised signal.

8. Jourjine et al. ("Blind Separation of Disjoint Orthogonal Signals: Demixing N Sources from 2 Mixtures") teaches a system for demixing narrowband mixtures comprising:

receiving a pair of signal mixtures (x_1 and x_2 , pg. 2, eq. 1 and 2);
constructing time-frequency representations of each mixture (eq. 7); and
constructing histograms and estimating the amplitude ratio and delay difference parameters therefrom (fig. 1).

Jourjine does not teach constructing the two histograms for a broadband signal-of-interest segment and a non-signal-of-interest segment, combining these to create a weighting matrix, rescaling the time-frequency components using said weighting matrix, and resynthesizing the demixed signal from the reweighted time-frequency representations.

Gustafsson (U.S. Pub No. 2002/0051500) teaches a system for separating a mixture using a calculated weighting matrix utilized to obtain adaptive filter coefficients.

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However, Gustafsson does not teach nor fairly suggests calculating this weighting matrix by combining two histograms and does not teach rescaling the time-frequency components of the mixture to obtain the denoised signal.

Therefore, it would have not been obvious to one of ordinary skill at the time of invention to combine these references to arrive at the applicant's invention.

9. Dependent claims 2-5 and 9-14 are allowable because they further limit the subject matter in which they refer.

10. Claims 6-8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Jourjine et al. (U.S. Pat 6,430,528), Rickard et al. ("DOA Estimation of Many W-Disjoint Othogonal Sources from Two Mixtures Using DUET"), Balan et al. (U.S. Pub No. 2003/0233213), and Balan et al. (U.S. Pub No. 2002/0042685 filed after the instant application) all teach forming histograms from time-frequency representations of signal mixtures. Papadlas (U.S. Pat 6,654,719) and Soon et al. ("A Robust Method for Wideband Signal Separation") both teach additional

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Art Unit: 2655

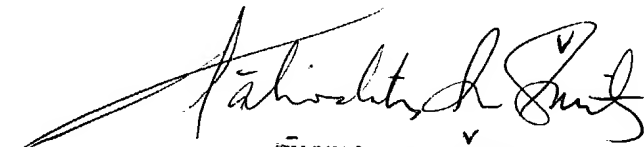
methods of blind source separation. Zhao et al. (U.S. Pat. 6,480,823) and Faller (U.S. Pat 6,647,365) teach methods for noise detection.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J Sked whose telephone number is (703) 305-8663. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis Smits can be reached on (703) 306-3011. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MS
07/14/04



TĀLIVALDIS IVARS ŠMITS
PRIMARY EXAMINER

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